UNITED STATES DEPARTMENT OF AGRICULTURE
Radio Service
OFFICE OF INFORMATION

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LIVING WITH THE CORN BORER
(Eastern Infested Area)

Anytime, week beginning
March 5, 1928.

NOT FOR PUBLICATION

ANNOUNCEMENT: Farmers of this region are learning to live with a most undesirable insect neighbor--the European corn borer. Since this pest first crossed the Atlantic 18 years ago, it has naturalized itself as an American farm nuisance. It is apparently here to stay. Federal and State governments are making strenuous efforts to find means of making its residence here as uncomfortable as possible.

Radio Station _____ is cooperating with the corn borer control campaign of state and nation by giving its listeners each week at this time a review of the present corn borer situation and explanations of practical spring control methods. The information is supplied by the U. S. Department of Agriculture, and the broadcasts will be known as LIVING WITH THE CORN BORER.

As the first step in this radio effort to help make life miserable for the corn borer, a specialist of the department of agriculture today is going to answer some questions which we all naturally want to ask--how this pestiferous neighbor thrived last year, whether it settled in any new territory, and what to do right away to cut down the number of corn borer boarders in the cornfields during the 1928 crop season. I'm going to put the department specialist, who for the purposes of this interview will be known as Mr. Jack Stone, through the first "ask Uncle Sam another" session. And here's the first question I am going to put to him:

Mr. Stone, the first thing I want to know is, did the European Corn Borer increase in numbers in 1927?

STONE: The answer is yes and no. That is, in Ohio and New York, representing two-thirds of the control area, the numbers of corn borers were reduced. But in Michigan and Pennsylvania, where conditions were apparently favorable to increase, the borer population more than doubled. Because of the increases in these states, there were 1 and ½ times as many borers in the whole area at the end of 1927 as there had been at the end of 1926.

ANNOUNCER: How much of a reduction in the number of borers was there in Ohio and New York?

STONE: Before giving the answer, I ought to explain that we report the corn borer census returns in terms of numbers of borers per 100 corn stalks. On that basis, the reduction in Ohio was from 6 borers per 100 stalks in 1926 to 5 borers per 100 stalks in 1927. In New York the 1926 count showed 12 borers per 100 stalks and the 1927 count showed 10. Not many borers, comparatively speaking, have settled in Indiana. Even in 1927,

infested Indiana regions had less than one borer to each 100 stalks of corn.

ANNOUNCER: Now tell me, Mr. Stone, if the corn borer invaded any new territory last year.

STONE: Yes, the borer was discovered for the first time in 1927 in 55 counties where it hadn't been found in 1926. The principal spread was to the South in Ohio as far as Pickaway county; to the West in Indiana to within 30 miles of Lake Michigan; and to the North in Michigan to the Straits of Mackinac. By states, the number of counties newly found infested last year was: Ohio, 18; Pennsylvania, 14; Michigan, 12; Indiana, 10; and New York, 1.

ANNOUNCER: That satisfies my curiosity about the increase in numbers of corn borers and the extent of their spread into new territory last year. Now I'd like to know just exactly what means of controlling the corn borer have been found from the past years' experience in fighting it.

STONE: Briefly stated, the opinion of the U. S. Department of Agriculture is that serious commercial injury by the corn borer--------

ANNOUNCER: Just a second; put me straight please on what you mean by serious commercial injury.

STONE: I can't put you entirely straight on that in a second. Commercial damage depends upon the number of borers per stalk, the variety of corn, and the size and vigor of the plants. The specialists say that a field in which the average stalk is giving board and lodging to five borers probably won't be commercially damaged, but one with 30 borers to the stalk will produce no crop. In field corn "commercial" damage begins to be felt when the borer population gets to 10 per stalk. Slightly fewer borers per stalk will cause "commercial" damage to sweet corn.

Now to get back to control methods. As I said, the department holds that serious commercial damage by the corn borer can be pretty well prevented by sticking to the low-cutting, clean plowing, poling, raking and burning methods of control. Even though the wet spring last year enormously increased the difficulties of cleaining up by such methods, the 1927 campaign showed that they will retard the increase in borers, or actually reduce their numbers, as resulted, for example, in Ohio and New York.

ANNOUNCER: Well, let's get down to cases on the spring work that needs to be done in order to keep the borer under our thumb. First, tell me where the borers have been staying on our farms during the winter months.

STONE: During the winter months the borer hibernates in old pieces of corn stalk, stubble, or cob, either in the fields or in the barnyard. Its favorite winter retreat is high stubble left in the field. As the stalk dries up the borer crawls down toward the roots where there is more moisture, and lives comfortably enough during the winter. But the borer will hole up for the cold season in any old piece of last year's corn plant

around the farm. In June the borer turns into a moth which flies about for two or three weeks, and lays about 400 eggs. These eggs hatch into larvae--that is, the borers--which do the damage to the corn crop. In the opinion of scientists about 15 of each 100 larvae get into the corn plant, so that the average borer produces 60 effective children to harry the farmer next season.

ANNOUNCER: So then it is necessary to get rid of every piece of last year's corn plant in a way that will kill the borer?

STONE: Exactly.

ANNOUNCER: And how can that be done?

STONE: By low cutting, plowing completely under all corn refuse, raking and burning, and ensiling and shredding.

ANNOUNCER: Well, now, take a specific case: how should a stubble field be handled to control the corn borer?

STONE: Farmers solve the stubble problem by low cutting which leaves stubble 2 inches or less in height. If the standing stubble is higher than that it must be either completely plowed under or broken or cut off close to the ground. If it is broken off or cut off, the stubble is raked and burned. Under some circumstances, a stubble shaver is used.

When the field is plowed all corn refuse and remnants must be completely turned under. A 14-inch bottom plow equipped with wires for covering trash gives good results when it is properly adjusted. The new and specially designed 16-inch and 18-inch bottom plows recently placed on the market are well adapted for clean plowing and have given good results when used in standing cornstalks and stubble. Whatever method is used, the field should be left clean with no pieces of corn stalk on the surface to shelter corn borers. It's well to remember that every borer left a home in corn stubble or corn refuse now will show its gratitude by sending along 60 or so children to eat corn at your expense next July.

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ANNOUNCEMENT: In our interview next week with the men who know the facts about corn borer, we'll learn more about the pest's habits, its present doings, and methods that are meeting with some success in keeping the whip hand over it. Meanwhile, if you have any questions to aks about the corn borer, send them along. Station _____ will get authoritative answers from the department of agriculture.

UNITED STATES DEPARTMENT OF AGRICULTURE
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LIVING WITH THE CORN BORER
(Eastern Infested Area)

Anytime, week of March 12

(NOT FOR PUBLICATION)

(ANNOUNCER: One announcer only is required for this release)

ANNOUNCEMENT: Now comes the weekly 10-minute period which Station_____ and its farmer listeners devote to a discussion of the farming problems raised by the necessity of LIVING WITH THE CORN BORER. Today, a specialist of the U.S. Department of Agriculture, a leader in the federal and state drive against the corn borer, supplies facts about what the borer has done where it got well established, and about just how farmers carry on one of the most important spring control measures--clean plowing.

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In Kent County, Ontario, Canada, John Johnson farms 150 acres of good land. Until two years ago his main source of income was Flint corn which he sold for seed. The 30 acres he usually planted to corn yielded from 500 to 1,000 bushels according to the season. Then came the corn borer invasion. In 1926, Johnson reduced the corn acreage to 19 acres, because of borer damage. He got only 200 bushels from the 19 acres. Last year he cut his corn planting to 10 acres. This year he doesn't intend to grow corn. He replaces the corn with beans, cabbage, and more wheat.

Johnson estimates conservatively that the corn borer has decreased his income $500 per year.

His experience is a pretty good answer to the question sometimes raised-- does the corn borer menace the corn crop of the United States?

It's a startling answer, true enough. But there is this encouraging footnote to Johnson's story. He believes that a smaller corn acreage for a few years and a permanent clean-up can hold the pest in check. That he's correct is indicated by the fact that the Ontario clean-up in the spring of 1927 reduced corn-borer infestation 50 per cent. The Canadians, along with farmers of the United States, are learning to live with the corn borer and keep it under control.

It seems worth while to try to keep down borer damage when we recall that the fight is made to protect a crop valued annually at about 2 billion dollars; a crop, moreover, on which our great livestock industry depends.

Joe Srigley, another Ontario farmer living in Kent county, has a true story to tell that indicates how the corn borer affects stock raising.

Srigley used to specialize in hogs, selling as much as $1,500 worth of hogs each year. The corn borer has forced him to shift to poultry. Last year he planted four acres of corn. Before the corn borer came to Ontario and started eating the corn he used to feed to hogs, he planted 30 acres. Now he keeps a flock of 750 chickens and a herd of 10 dairy cows to take the place of hogs and corn.

But of course farmers in this region know the mischief done by the corn borer. Right now they are planning the spring operations necessary to bring the borer under control. One of the most important of these operations is clean plowing, and the remainder of this talk will be devoted to answering five questions about plowing that are continually cropping up. The first is:

Does plowing kill the borer?

And the answer is that the mere plowing under of infested cornstalks does not of itself kill many borers. Most of the pests crawl up to the surface sooner or later. But notice this: if a clean job of plowing is done, borers coming to the surface can't find any shelter. Exposed to the weather and to the attacks of their natural enemies--birds, ants, ground beetles, and various insect parasites and predators--they soon perish.

On the other hand, if the plowing job isn't cleanly done, the borers reaching the surface lodge in fragments of corn husks, cornstalks, corn leaves, stubble, and weeds that may be there and remain snugly housed until they emerge as moths to lay the eggs from which the 1928 army of borers will come.

Now you naturally want to know just what is a clean job of plowing for borer control.

It is plowing which leaves no plant material of any kind on the surface. Not only that, all fragments which might shelter borers must be buried so thoroughly that none will be dragged to the surface later in disking and cultivating. To insure this result, plowing to a depth of 6 inches is recommended; also surface cultivation after plowing to close all large cracks and crevices. But if it isn't possible to plow to a depth of 6 inches, a clean job still can be done by skilful plowmen. The depth isn't important, so long as all fragments are covered to stay covered.

Poor or ordinary plowing does not control the corn borer, and in a good many ways is worse than no attempt to cover litter because it is difficult to clean up a poorly plowed field by other methods.

Now, I can hear you asking, "How can a clean job of plowing be done?"

As I've just said, the skill of the plowman is just as important as the size or type of plow used. Careful, painstaking work to see that all surface refuse is turned under is the first essential. As to the kind of plow: a 14-inch bottom plow equipped with attachments for covering trash gives good results when properly adjusted.

Many farmers have found that fastening three No. 9 galvanized or wrought iron wires to the plow helps cover the trash securely. These wires are about 10 feet long and trail behind the plow. The loose ends are caught by the furrow slice as it turns over. The weight of the soil on the buried ends holds the wire taut, and the wires hold the trash and stalks to the bottom of the furrow slice.

New, especially-designed 16-inch and 18-inch plows well adapted for clean plowing have recently been placed on the market. They do good work in fields of standing corn stalks. Field tests with these plows showed that with the aid of a rolling coulter of proper size and of the wires just described they completely turn under all standing corn stalks and all trash.

And finally, what is the best time to plow for borer control?

It varies with the region. In the Lake Erie area if the stalks are plowed under in the late fall most of the borers remain inactive in the stalks all through the winter and then crawl to the surface when the soil warms up in April or May. If the stalks are plowed under in late summer, early fall, or spring most of the borers come to the surface soon after plowing. In either case, the important thing is to see that the borers find on the surface no refuse in which to hide. Time of plowing is immaterial.

In New England fields the behavior of the borers plowed under in the late fall is different. There, many of the borers buried by plowing after November 1, die before they ever get to the surface. On the other hand, most of the New England borers plowed under in the summer, early fall, or spring migrate to the surface in just about the same way as the borers in the Lake Erie region.

Late fall plowing, therefore, is most effective in New England because it kills off some borers beneath the surface as well as depriving of shelter the borers which survive and get to the surface.

Just a brief summary of the important things to remember about spring plowing to control the corn borer:

First, if plowing is to be effective all trash must be turned completely under so that material may not by later cultivation be dragged to the surface before time for the moths to emerge.

Second, clean plowing controls borers by depriving them of shelter when they crawl to the surface.

Third, average plowing methods must be improved sufficiently to insure that all cornstalks and trash are turned completely under.

Fourth, neither depth of plowing nor time of plowing is important for borer control if a clean job is done and material is not afterward dragged to the soil surface.

Fifth, and last, for a more extended discussion of corn borer control methods, secure Farmers' Bulletin No. 1-5-4-8, issued by the United States department of agriculture.

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ANNOUNCEMENT: And that concludes the second of nine weekly broadcasts for which Station_____ has arranged with the U. S. Department of Agriculture in order to aid in the campaign against that menacing crop pest, the European corn borer. Listeners wishing the bulletin just mentioned, may send requests to this station. For the benefit of those who may have missed the number of the bulletin, it is Farmers' Bulletin 1-5-4-8.

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UNITED STATES DEPARTMENT OF AGRICULTURE
Radio Service
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LIVING WITH THE CORN BORER
(Eastern Infested Areas)

Anytime, week of April 16.

NOT FOR PUBLICATION

ANNOUNCEMENT: Now comes the weekly discussion of ways and means of LIVING WITH THE CORN BORER and growing corn in spite of it. Today we give a rest to the investigators who figure out permanent interruptions to the private life of the borer. A couple of the thousands of dirt farmers who carry out the scientists' plans to make life uncertain for the insect will tell how they did a good job of it last year. The first is Bert J. Dorsey, a successful New York corn grower.

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"When orders came to clean up last spring I plowed my stubble under deep--at least nine inches, "Mr. Dorsey starts his story.

"Then I used a disk on the fields, which tended to drive the stubble down still further into the earth. I went easy on dragging the former corn lots so as not to unearth any of the buried stalks. A homely contrivance consisting of a dry-goods box attached to the drag by a piece of chain cut down the work of picking up stalk fragments after dragging. As I and my men dragged the fields we reached down, picked up every piece of stubble and stalk the drag had pulled up, and threw all of them into the box.

"After rolling the field, we combed it again for loose trash, but found little. In harvesting I took care to cut the stalks about two inches above the ground. As soon as the crop had been taken off the field I turned the cows loose in it. You'd be surprised what a lot of hungry cows can do to a stubble field, even if the stubble is cut right next to the ground.

"Last year there were borers in my fields. This year I haven't been able to find any. I'm going to duplicate the control methods of last year again this spring. Their success is encouraging," Mr. Dorsey declares.

Now let's put on the stand another man direct from the corn borer firing line.

He's Adolph Heyman of Quincy, Mich., who had to tackle adverse conditions for clean-up last year. But Mr. Heyman did the job--and believes it was work well spent.

Mr. Heyman had a 99-acre farm of heavy, rich, black-loam soil, with 26 acres in standing cornstalks to clean up. First he used a gang plow, but the weather was wet, and the soil stuck to the moldboards. Then he tried a 16-inch walking plow of another make. It also failed to do the work. The first of May was only a few days away, and it began to look as if Mr. Heyman couldn't get the clean-up done in time to comply with the Michigan regulations.

Then the weather turned for the better, and the soil dried out somewhat. For the third time, Mr. Heyman went into that field-- and the third time proved to be the proverbial "charm." He turned out a splendid job of plowing, completely covering the stalks, and along with them the borers.

Now let's turn from the experiences of Mr. Dorsey and Mr. Heyman, and take a look at the State regulations that they took such pains to comply with. In the Great Lakes area the States of Michigan, Ohio, Indiana, Pennsylvania, and New York by law require a clean-up of the previous year's corn fields, and in New England, Massachusetts has clean-up regulations applying to all plants which harbor the corn borer.

In New York State the regulatory area is limited to all of Niagara, practically all of Erie, and designated townships in Chautauqua and Cattaragus counties.

Farmers within this regulatory area are required to do two things: First, to plow completely under, bury, or burn all cornstalks, corn stubble, cobs, weeds, and trash left in the field; Second, to plow completely under, bury, or burn all cornstalks, cobs, and trash in barnyards, feedlots, stacks, buildings, or elsewhere which have not been shredded or made into silage.

Information about the menace of the corn borer and methods of corn borer control is being distributed by State workers in other New York counties outside the regulatory area. Especial attention to this educational campaign is paid in the areas around Schenectady and on Long Island.

So much for New York. In Pennsylvania the spring clean-up is moving rapidly forward. On April 1 the drive started in Erie, Crawford, and Mercer counties and parts of Warren county. Every farm in this area will be visited by inspectors of the Pennsylvania or the United States Departments of Agriculture. These inspectors will explain in detail to each farmer the requirements of the spring corn borer clean-up regulations.

A month after the first visit, the inspectors will return to the farms. On the second trip they will see whether or not all refuse that might carry the corn borer has been properly disposed of. They will give notices to all farmers who have failed to meet the campaign requirements. The notices will specify a certain time within which the necessary work must be completed. After the dead-line date the delinquent places will be cleaned up under State authority and the cost of the work will be assessed against the owner.

These regulations have been found necessary because control of the corn borer depends upon community-wide effort. The corn growers must help one another. Corn borer moths fly from field to field. Therefore, in order

to keep control all fields and other possible harboring places of the borer must be swept clean of corn and other refuse which will shelter the caterpillars now stirring into activity after the winter's hibernation. Kill these caterpillars and no moths will fly in June to lay the eggs from which will come the 1928 borer army.

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ANNOUNCEMENT: And as soon as the Spring control operations have been completed it will be necessary to think about handling harvest, storage, and feeding of the crop in the best way for borer control. The recommended methods are given in Farmers' Bulletin No. 1548. Listener requests for this bulletin may be transmitted through Station _____.

UNITED STATES DEPARTMENT OF AGRICULTURE
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LIVING WITH THE CORN BORER Week of April 30

(NOT FOR PUBLICATION)

ANNOUNCEMENT: Today, as the 1928 corn borer control program is going full tilt in fields and farmyards, Station _____ presents the ninth and last weekly radio review of the corn borer situation. In this final talk of the series, farmers and Federal and State corn borer control workers summarize what the 1927 clean-up accomplished, and outline the plans for this year's battle against the menacing insect pests.

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Back in 1917 when the vanguard of 2,000,000 American soldiers was starting for warring Europe, it was discovered that an army of European insects, corn borers, had obtained a foothold in America and was conducting a guerilla warfare upon the growers of our most important crop--corn.

The soldiers--except the hero dead and disabled--returned from the war to the fields and factories of the Nation. Farmers grappled with the job of after-war reconstruction. Meanwhile the corn borers were found at points further and further to the westward; toward the rich lands of the Corn Belt. Scientists observed these discoveries and looked for means of controlling the insect.

Suddenly, or so it seemed to all except the men who had anxiously watched the spread of the insect, it was realized that there was a corn borer problem. The pest overran fertile corn land in southern Ontario, Canada. In 1924 it caused a total failure on 10 square miles of two Canadian counties; in 1925, on 400 square miles; and in 1926, on 1200 square miles. Though the borer has been in the U. S. an equal length of time there has been little or no damage and this has been confined to a few farms bordering Lake Erie.

But aroused at the threat, farm leaders swung into action. Plans were formulated for stopping the insect advance. Fortunately, 9 years of experimental work had shown what control measures held promise of some success. The research findings were that concerted, community-wide clean-ups in all infested regions were the only workable control measures. So Congress appropriated funds to pay farmers for their extra labor in cleaning up their corn fields and to cover the expense of clearing fields not taken care of by farmers.

By means of an educational campaign, farmers were informed of the clean-up regulations and told how to meet the inspection requirements. If their work passed the inspectors, farmers were paid up to a maximum of two dollars per acre for the extra labor of cleaning up. More than four and a

quarter millions of dollars were paid to farmers as extra labor fees. After May 16, government crews entered the fields not cleaned up by farmers and completed the work.

Each farmer, in order to enable his place to pass inspection, was required to destroy all corn stalks or other corn remnants of the 1926 crop in the field, the barnyard, or elsewhere about the farm. The destruction could be accomplished by burning, plowing under, or finely shredding the pieces of the corn plant. Stubble had to be plowed under or destroyed.

How complete was this clean-up; how large a percentage of the borers were killed by these methods? These are questions which naturally arise as we review the history of the 1927 borer drive.

The regulations required all farmers in townships infested with the borers in the clean-up area to follow out instructions for destroying pieces of the corn plant. With the methods used a very nearly complete clean-up was secured throughout most of the area. That answers the first part of our question.

Now about percentage of borers killed by clean-up: Where the infestation was sufficiently large to make a count of borers, the entomologists estimate that some 98 per cent of the borers were destroyed by the clean-up. This figure varies, of course, in different areas under observation.

But that doesn't mean that in 1927 there were 96 to 98 per cent fewer borers than in 1926. Far from it. Because of the high rate of increase of the insect, destruction of, say, 96 per cent of the borers will do no more than limit the increase, it is calculated, so that the next year there will be 6 borers in place of each 5 of the preceding year.

Here's the way it figures out:

Begin with a destruction, by the clean-up, of 96 per cent of the borers. Then there would still be at large 4 out of each 100 borers from last year's brood. Of these 4 borers, 2 will normally be females. These 2 females will lay, on the average, 400 eggs each--or 800 eggs for both of them. Destruction of eggs, and death of the young borers will leave only about 120--or 15 per cent--of the entire possible number of 800 to become established as corn destroyers. If these 120 come through the dangers that, fortunately, beset borers, the rate of increase will be one and one-fifth borers for each one of the preceding year.

But put that up against the possible increase of 30 borers to each one of the previous year which scientists calculate could have been in 1927 had there been no clean-up, or with the actual increase of five to one which occurred in 1926 when there was no general clean-up, and it will be seen that the hard labor of disposing of corn remnants shows results in corn borer control.

Another way of finding out what the clean-up has done is to examine the experience of farmers who did the work. Here are a couple of corn-borer "True Stories" from infested regions which tell, from the individual farmer's standpoint, the results of the 1927 campaign:

Carl J. Ackerman, a farmer near Toledo, Ohio, says that in 1926 his 10 acres of sweet corn was an almost total loss, and that his 20 acres of field corn were badly damaged. In 1927, after the clean-up, he found that the infestation was much less and the damage was slight. He is making another through clean-up this year.

B. S. Knapp of Monroe, Michigan, has had corn borers in his fields for five years. He says that he followed thorough clean-up practices each year of the five, but that his labor was largely lost because other fields in the neighborhood were not cleaned up. The borers seemed to increase in numbers and more damage was done each year--- until 1927. Last year, with complete community-wide clean-up, Mr. Knapp's loss seemed to be cut about in half. Naturally, he is cleaning up his farm again this year and urges his neighbors to do likewise.

In the light of the experience of 1927, it is concluded that the corn borer can be controlled by mechanical means. Therefore, the United States Department of Agriculture plans to continue this year educational work to bring to every farmer in the corn-borer infested area knowledge of these methods by which the borer can be kept down economically and practically.

Meanwhile, Federal and State scientists are trying to find other methods of control which will supplement low-cutting, ensiling, shredding, feeding, burning, and plowing.

Scouting continues in an effort to determine in so far as possible just how far the borer has advanced so that control work may be made most effective.

Strict quarantine is being enforced to prevent the spread of the borer by artificial means. States desiring to enforce a clean-up without compensation have the cooperation of the Federal Department.

That's the organization side of the corn-borer plans for this year. Upon the shoulders of farmers themselves falls the most important duty--that of carrying out the control measures. Each farm presents a special clean-up problem which calls for knowledge of the situation and ingenuity and resource on the part of the farmer. In order to get a permanent record of present knowledge about combatting the borer, write for Farmers' Bulletin No. 1-5-6-2, "Farmer Practices Under Corn Borer Conditions," and Farmers' Bulletin No. 1-5-4-8, "The European Corn Borer, Its Present Status and Methods of Control."

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ANNOUNCEMENT: And that ends Station _____'s ninth and final weekly corn borer chat, prepared for our listeners by the United States Department of Agriculture. Should any listener wish to get the Farmers' Bulletins just mentioned in order to have some handy references on corn borer control, write us. The numbers of the bulletins are 1-5-6-2 and 1-5-4-8.